Data/MC-validation overview

Hadronic Calibration Workshop,

Munich, 03-05. 05. 2006

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data and mc

- **Data: (from the production)**

  /castor/cern.ch/grid/atlas/datafiles/ctb/realdata/11.0.3.v1/

  pions:

  cbnt_RecExTB_Combined_1103_v1_2102307.00001.root

  cbnt_RecExTB_Combined_1103_v1_2102225.00001.root

  event-Cut on the data:

  - Trigger==1
  - sADC_muTag<500

- **MC: (from the production)**

  /castor/cern.ch/grid/atlas/datafiles/ctb/MonteCarlo/reco/11.0.41/

  pions:

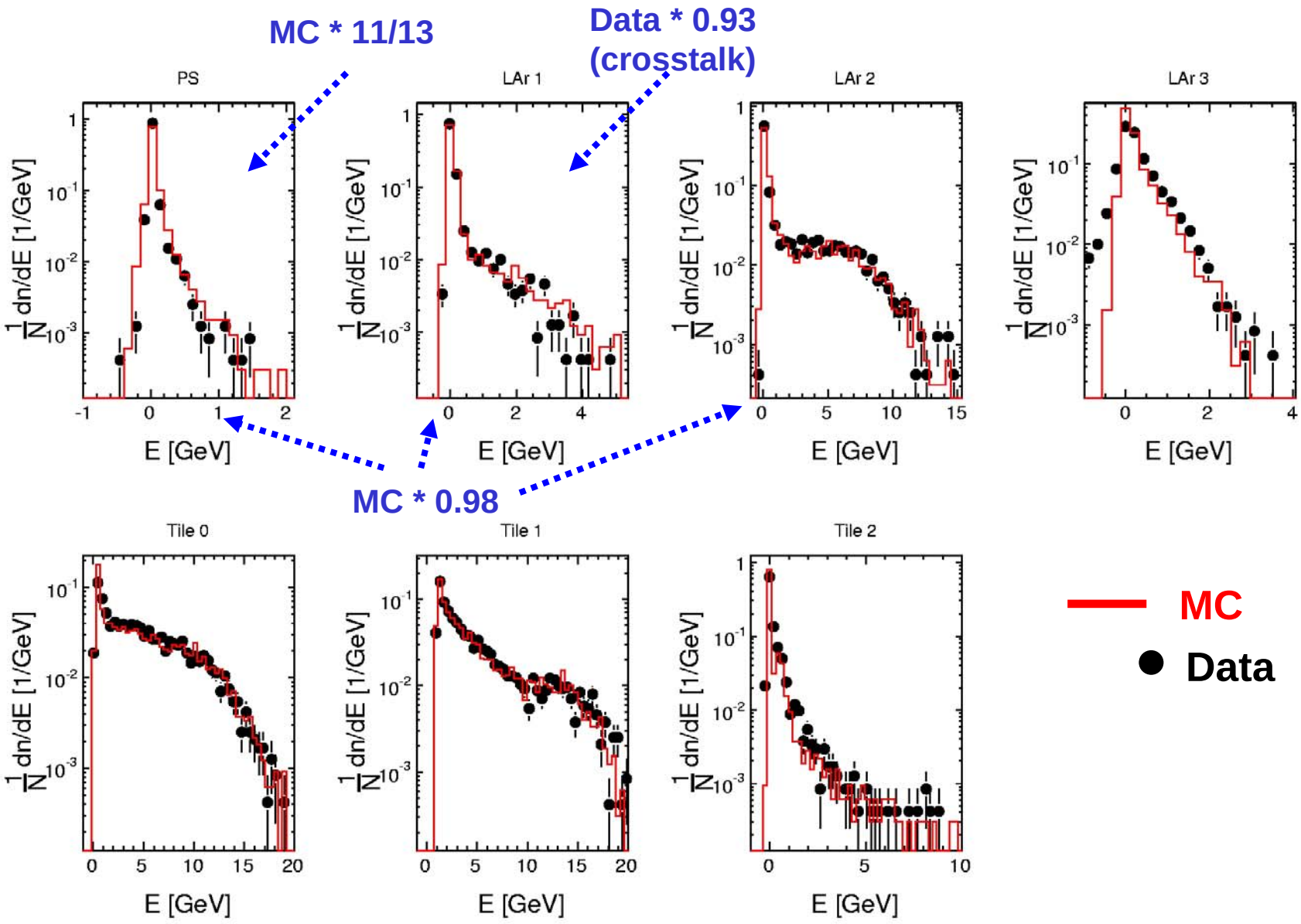
  ctb.2307.G4Ctb_CBNT.pi-_20GeV_eta_00.45_Mag_0.0.v4.1102.root

  ctb.2225.G4Ctb_CBNT.pi-_180GeV_eta_00.45_Mag_0.0.v4.1102.root

topics

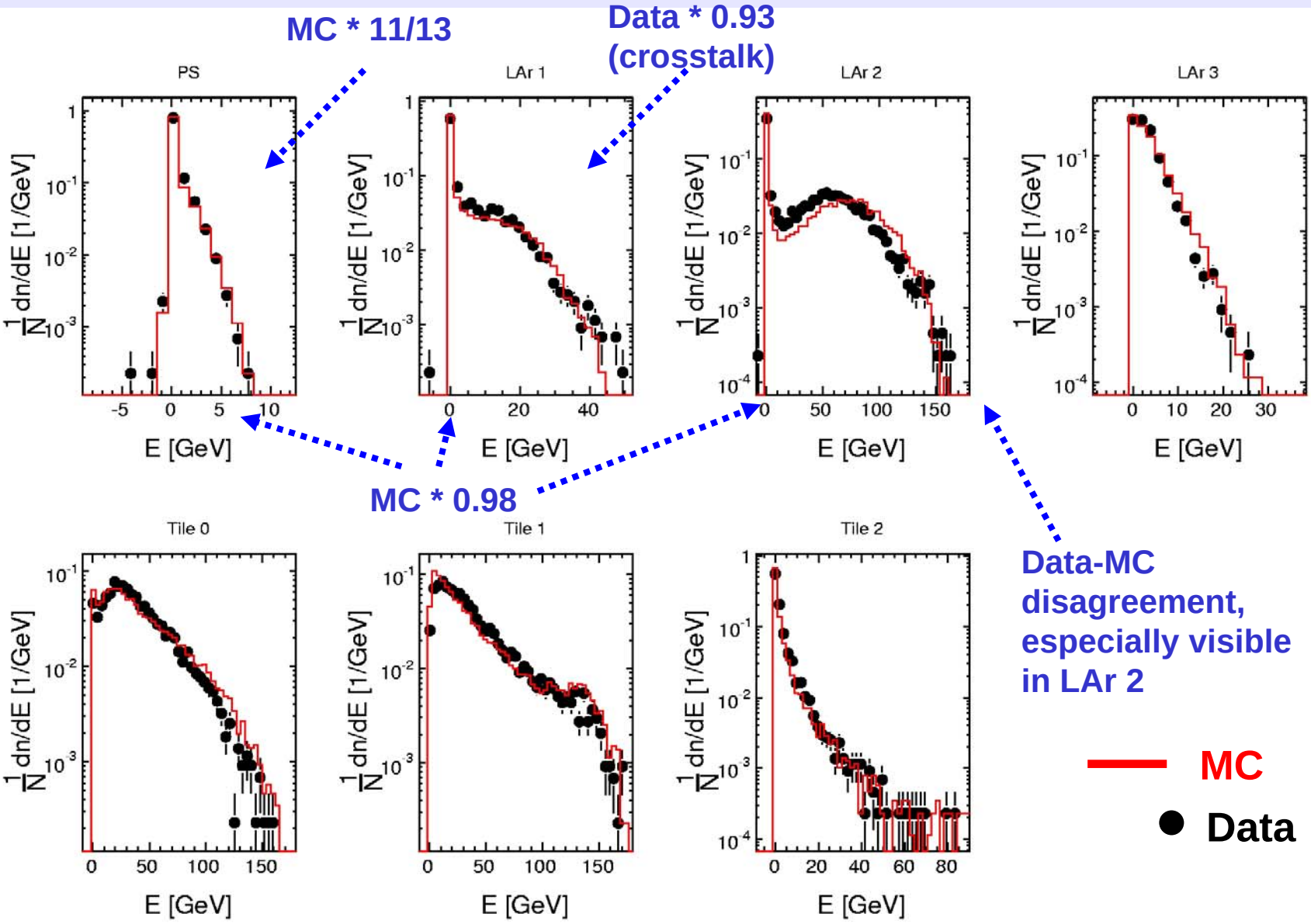
- **Cluster-Energy in the layers of the Calorimeters**
- **ClusterMoments (influence of η-reweighting)**
- **Cluster-configuration**
- **Cell-energies**

E_{vis} in Layers : E_{BEAM}=20 GeV



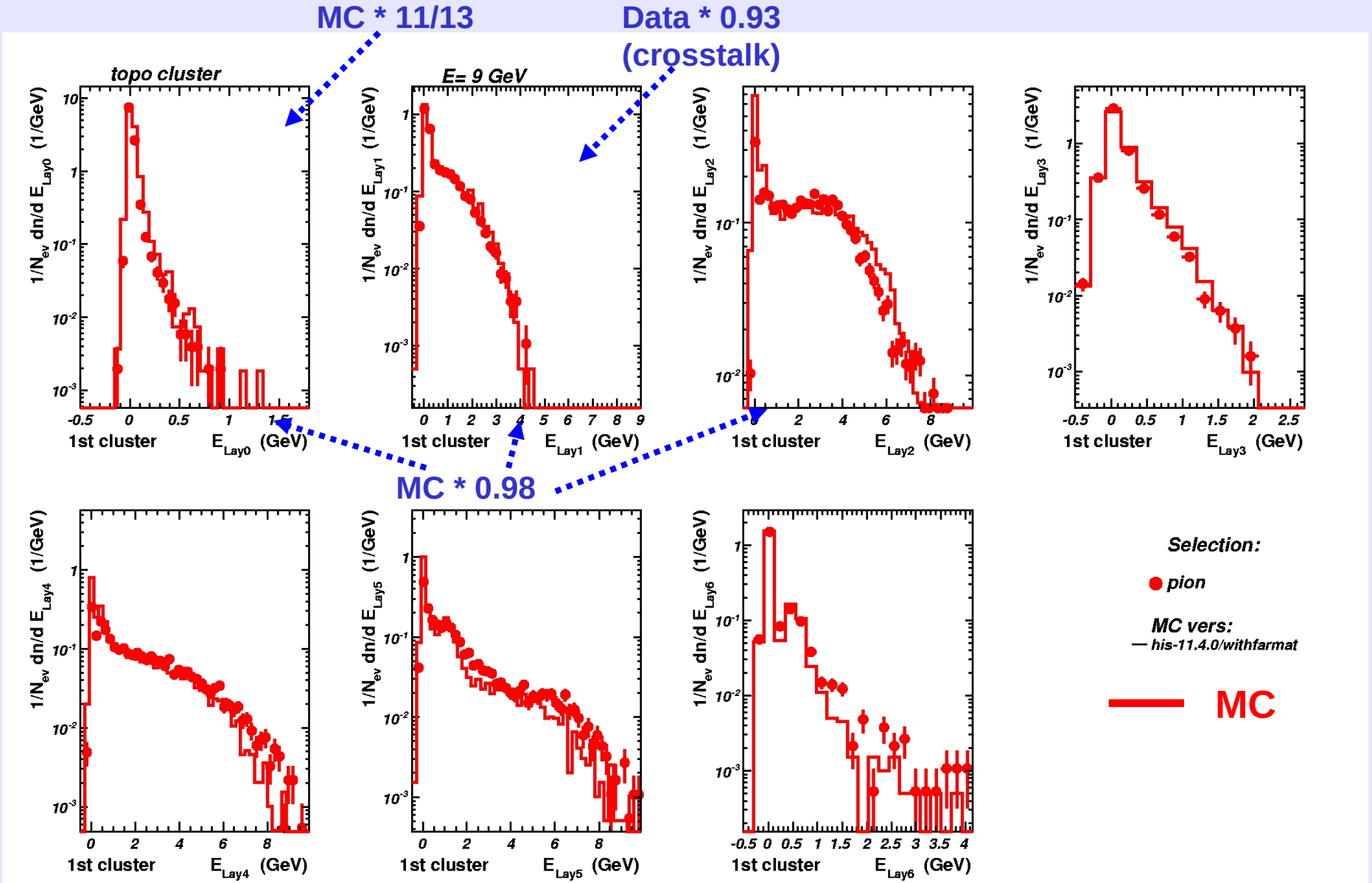
E_{vis} in Layers :

E_{BEAM}=180 GeV



E_{vis} in Layers :

E_{BEAM}=9 GeV

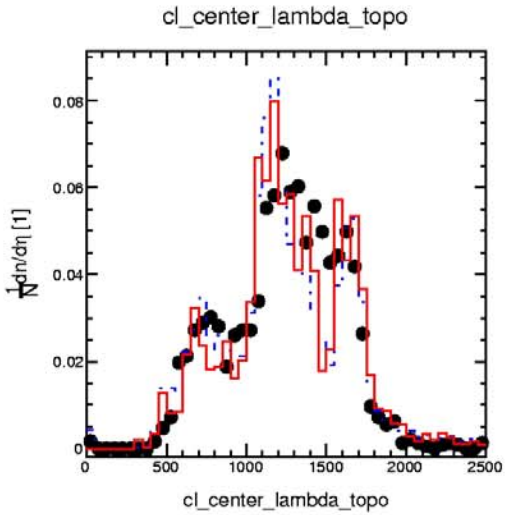


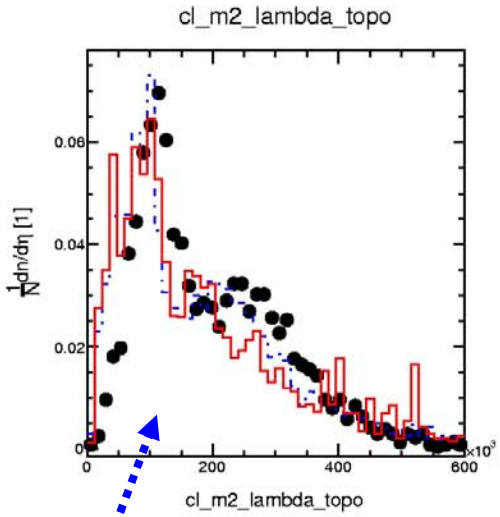
Energy in the Layers

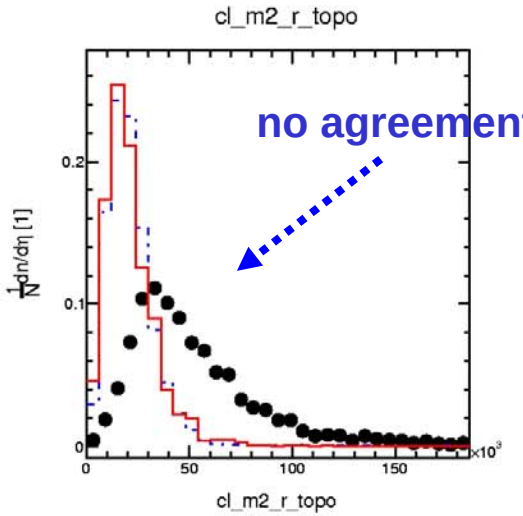
- **general agreement of Data and MC**
- **application of “known” and “estimated” factors to the layers-energy improves the data-mc agreement.**
- **problems at LAr at high beam energies:**
  - **? Lead-thickness → will be tested using 11.4.0**
  - **? other reason**

ClusterMoments:

E_{BEAM}=20 GeV

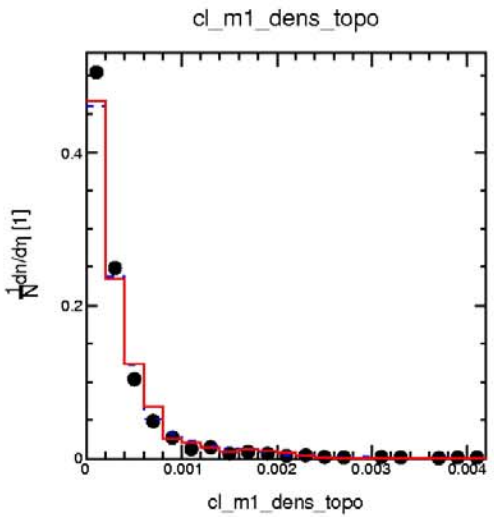


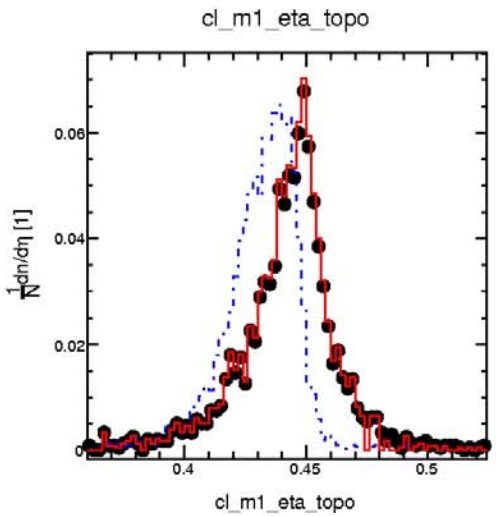


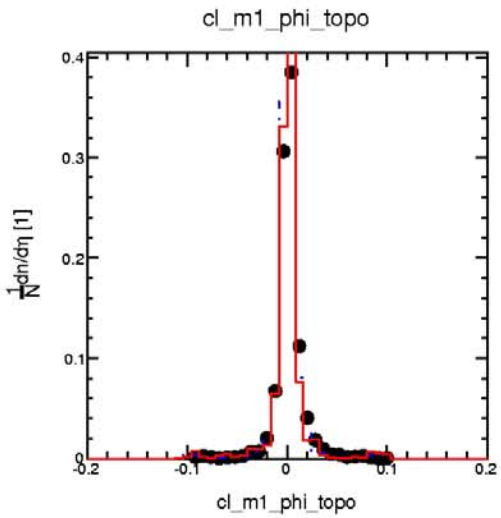


no agreement at all

worsenes at η-reweighting



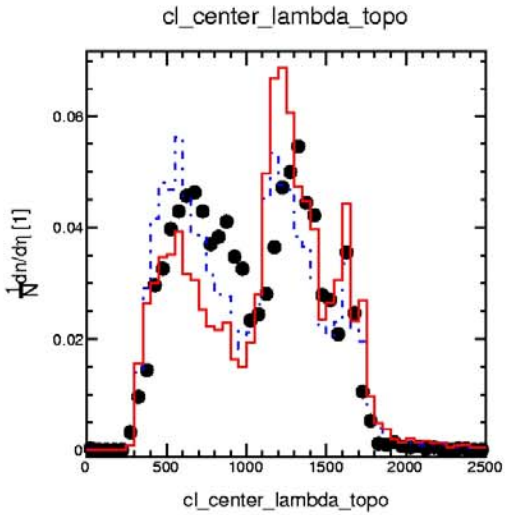


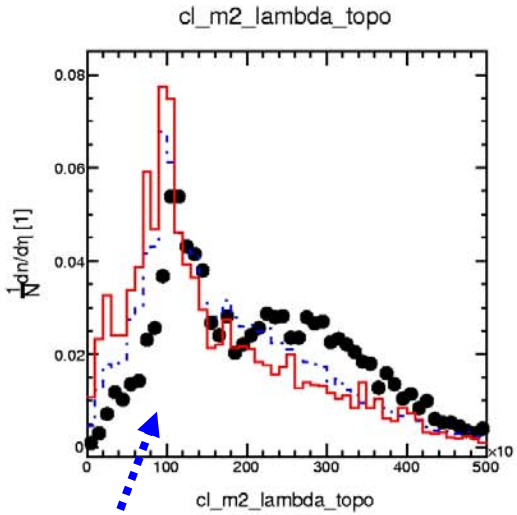


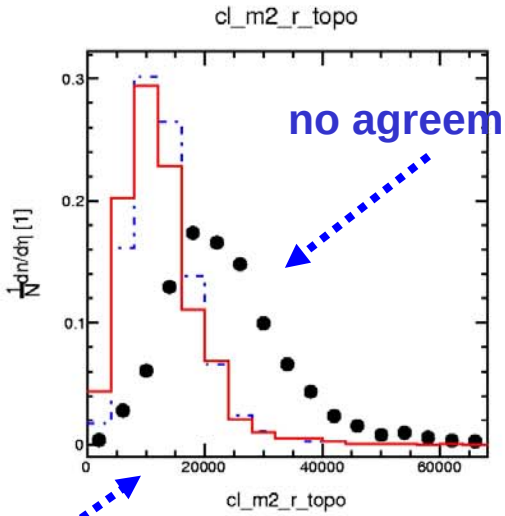
- Data
- MC
- MC, re-weighted

ClusterMoments:

E_{BEAM}=180 GeV







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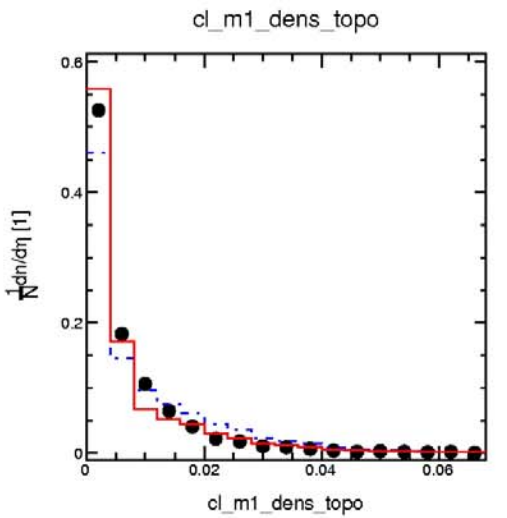
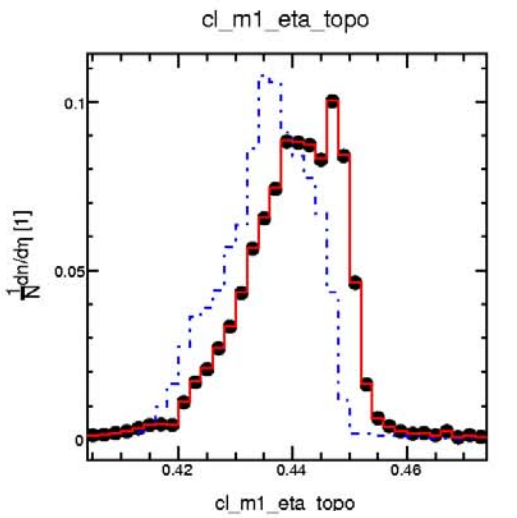
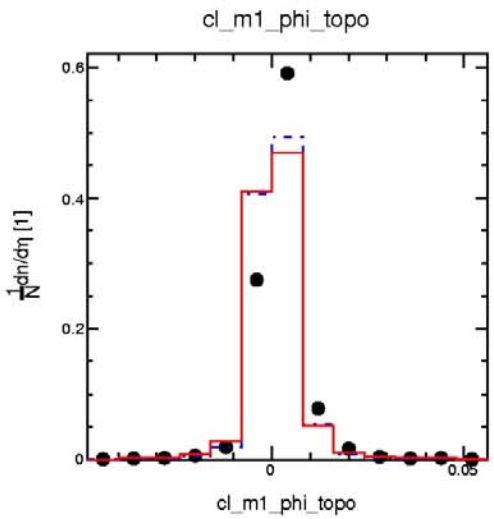


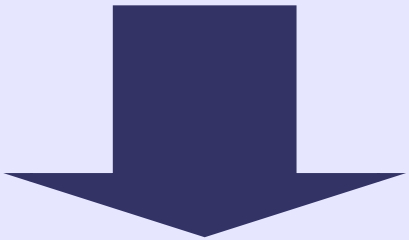




- Data
- MC
- MC, re-weighted

ClusterMoments (influence of η-reweighting)

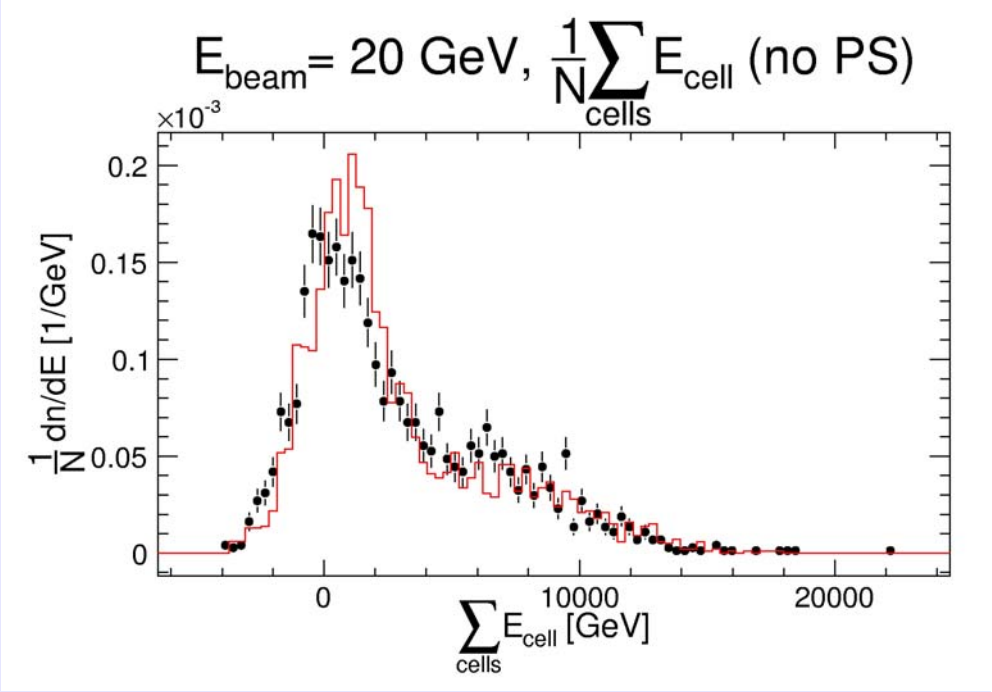
- **no improvement of m2_r and m2_lambda agreement due to η-reweighting**

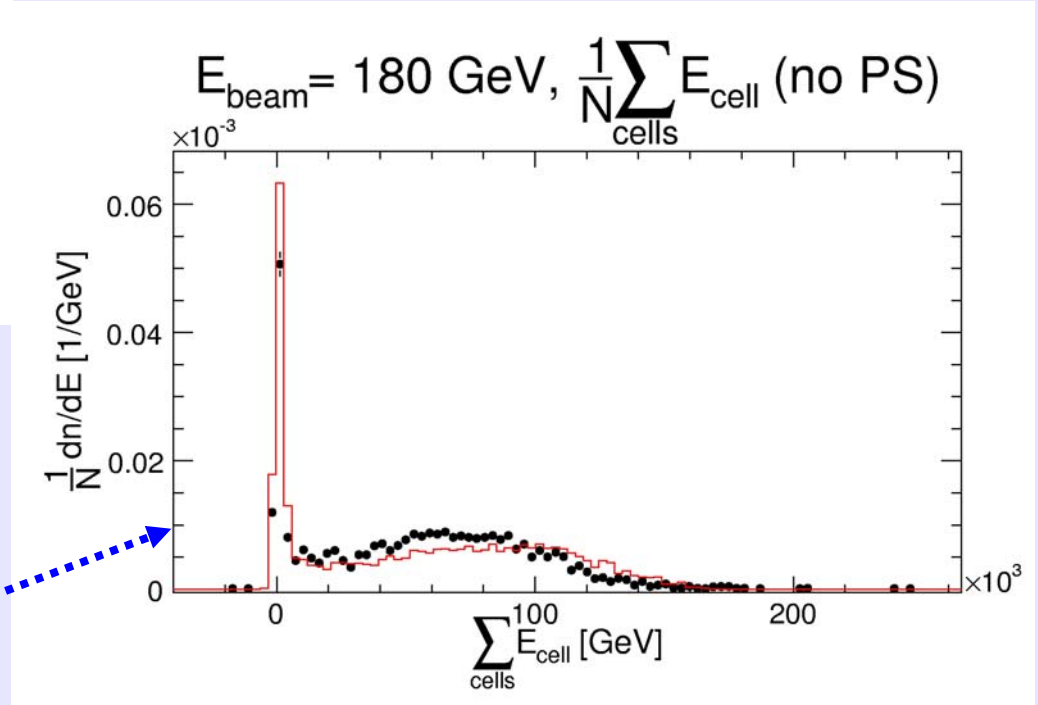


- **cluster shape differ in Data and MC ?**

- **Reconstruction with all existing ClusterMoments has to be done**

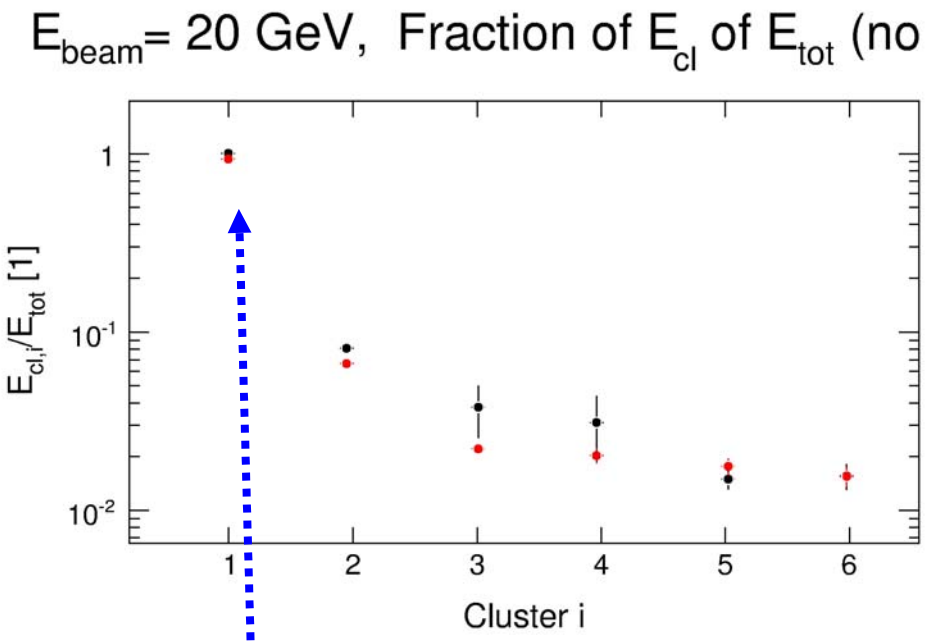
Sum of cell-energies





same difference as seen with TopoCluster in LAr

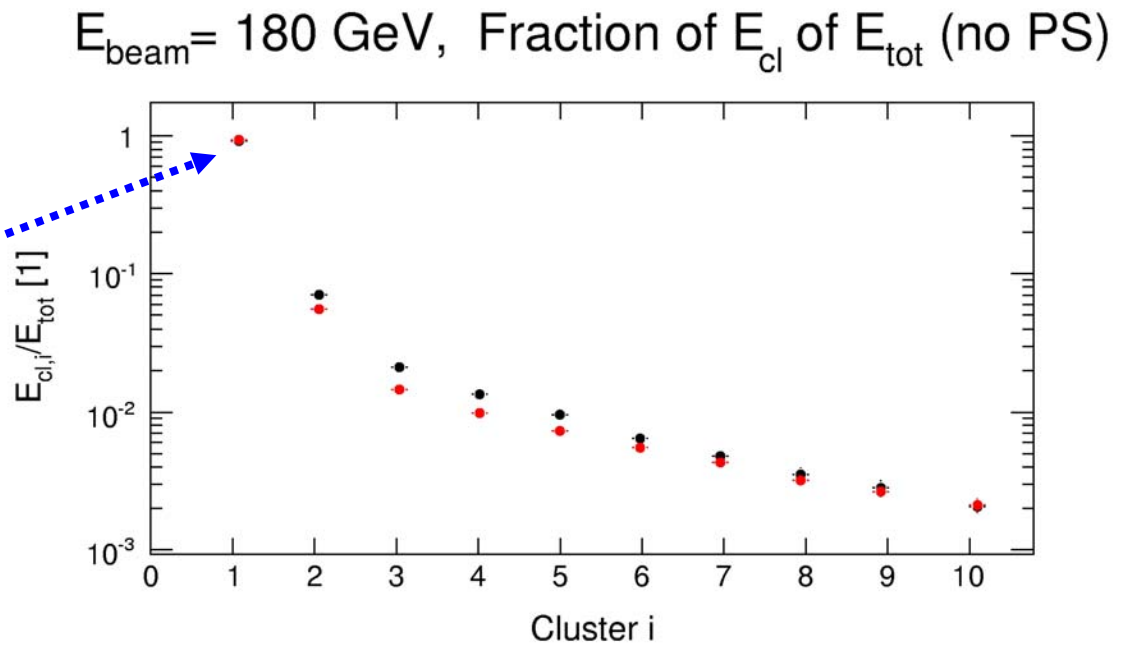
Cluster-configuration



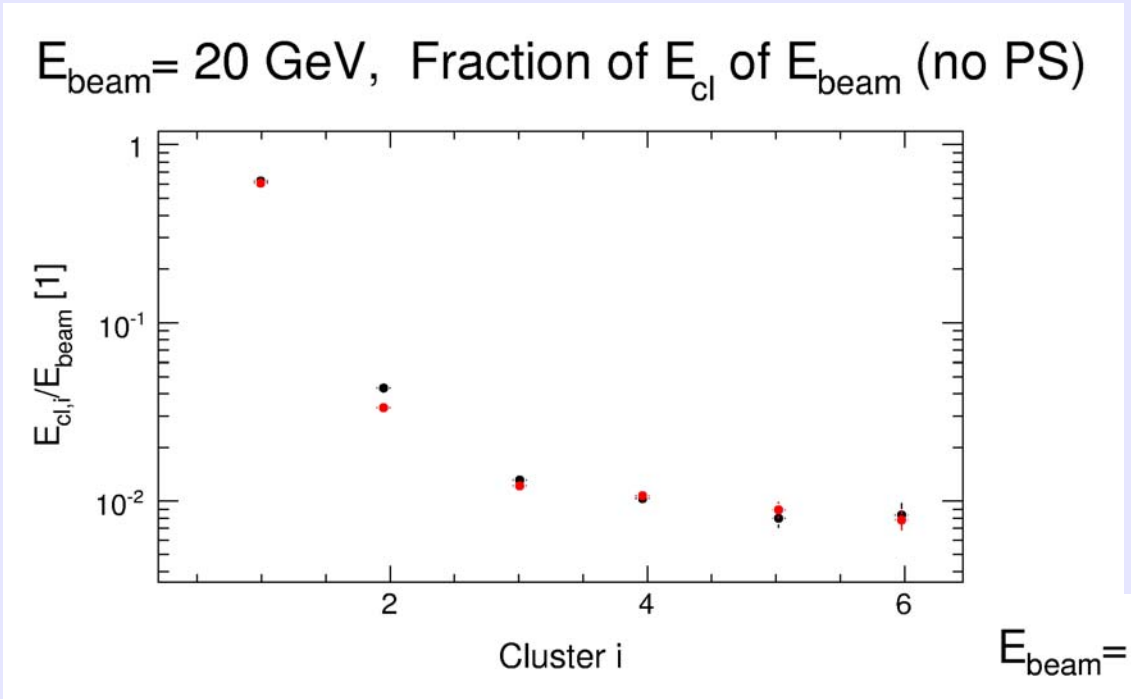
E_{tot}= Sum of E_{cell} of all Cells of the module

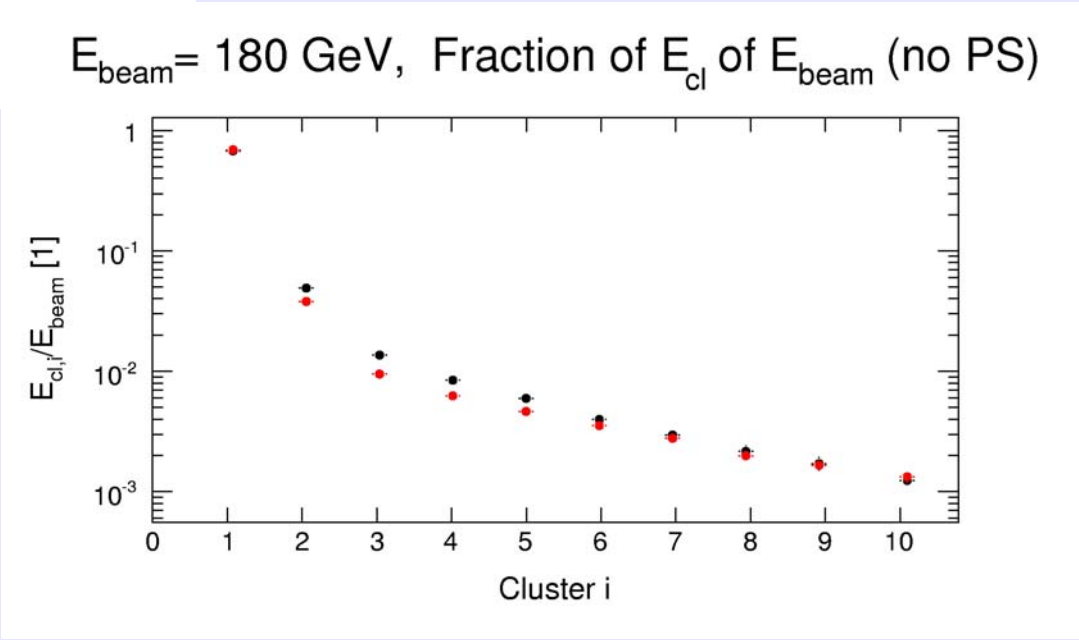
to be restricted ?

first cluster has basically the whole energy

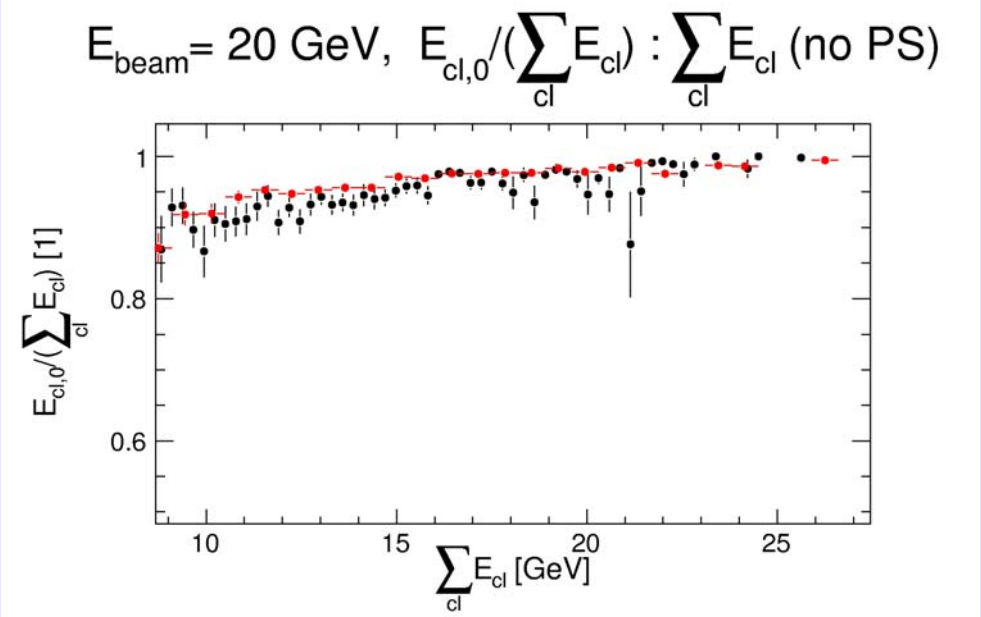


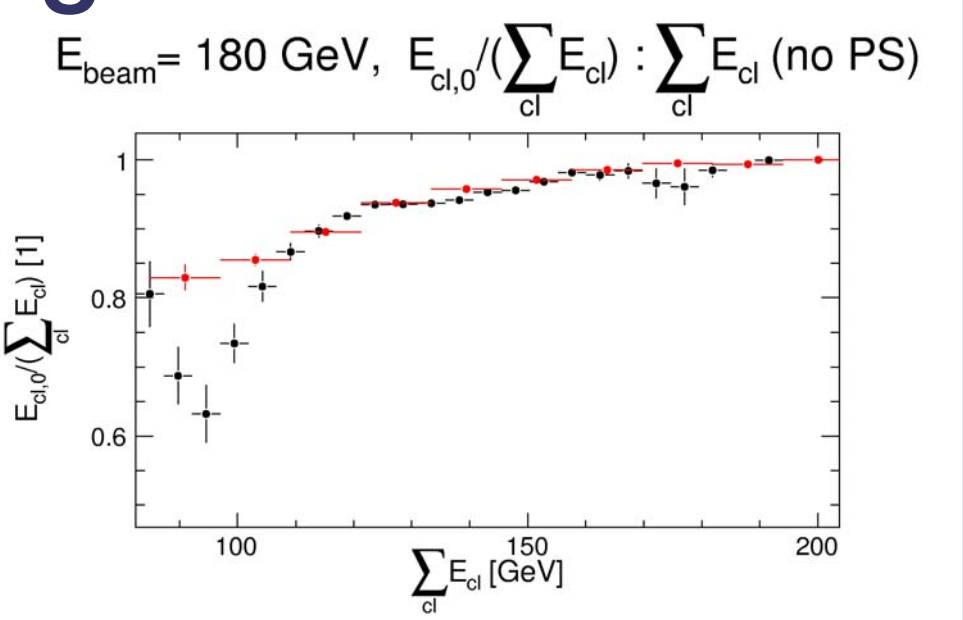
Cluster-configuration

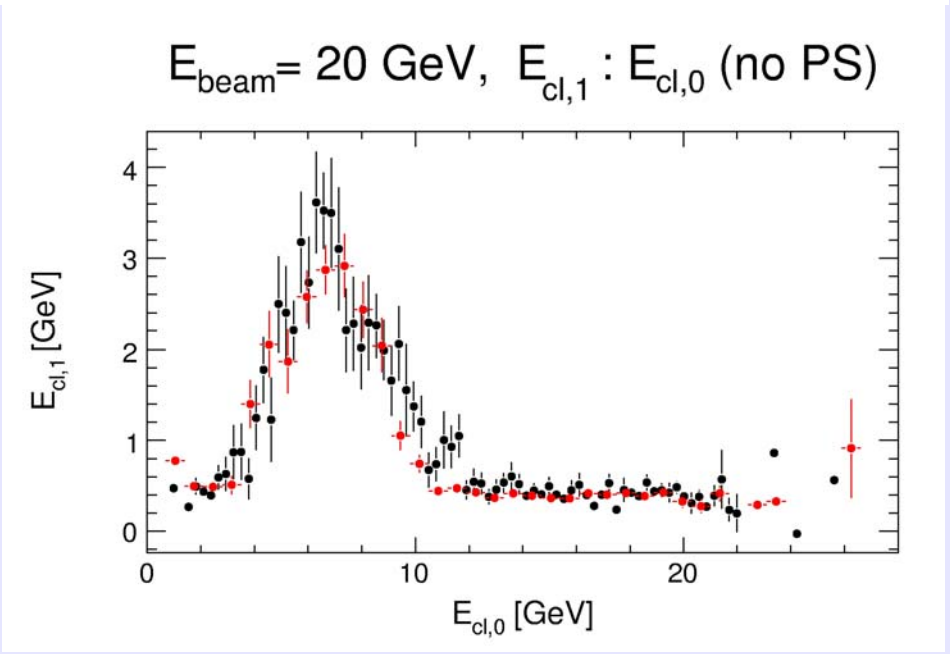


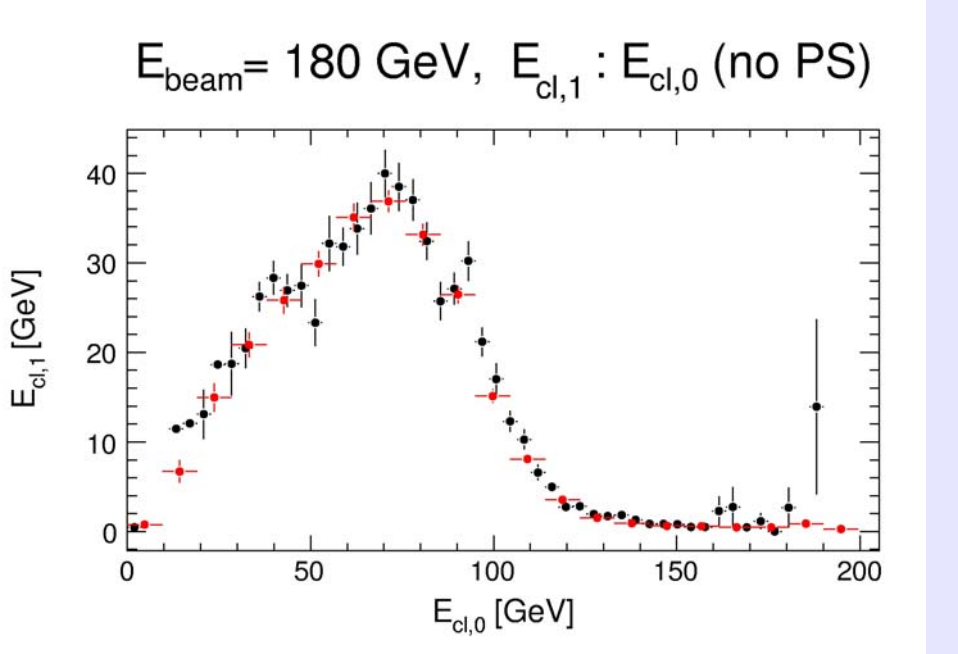


Cluster-configuration 3









Cluster-configuration 4

- **energy-proportion between clusters (first, second, sum,…) is well described by MC**

Conclusions

- **Layers → general agreement MC-Data, problems in LAr**
- **ClusterMoments → poor agreement MC-Data**
- **ClusterConfiguration → agreement MC-Data**

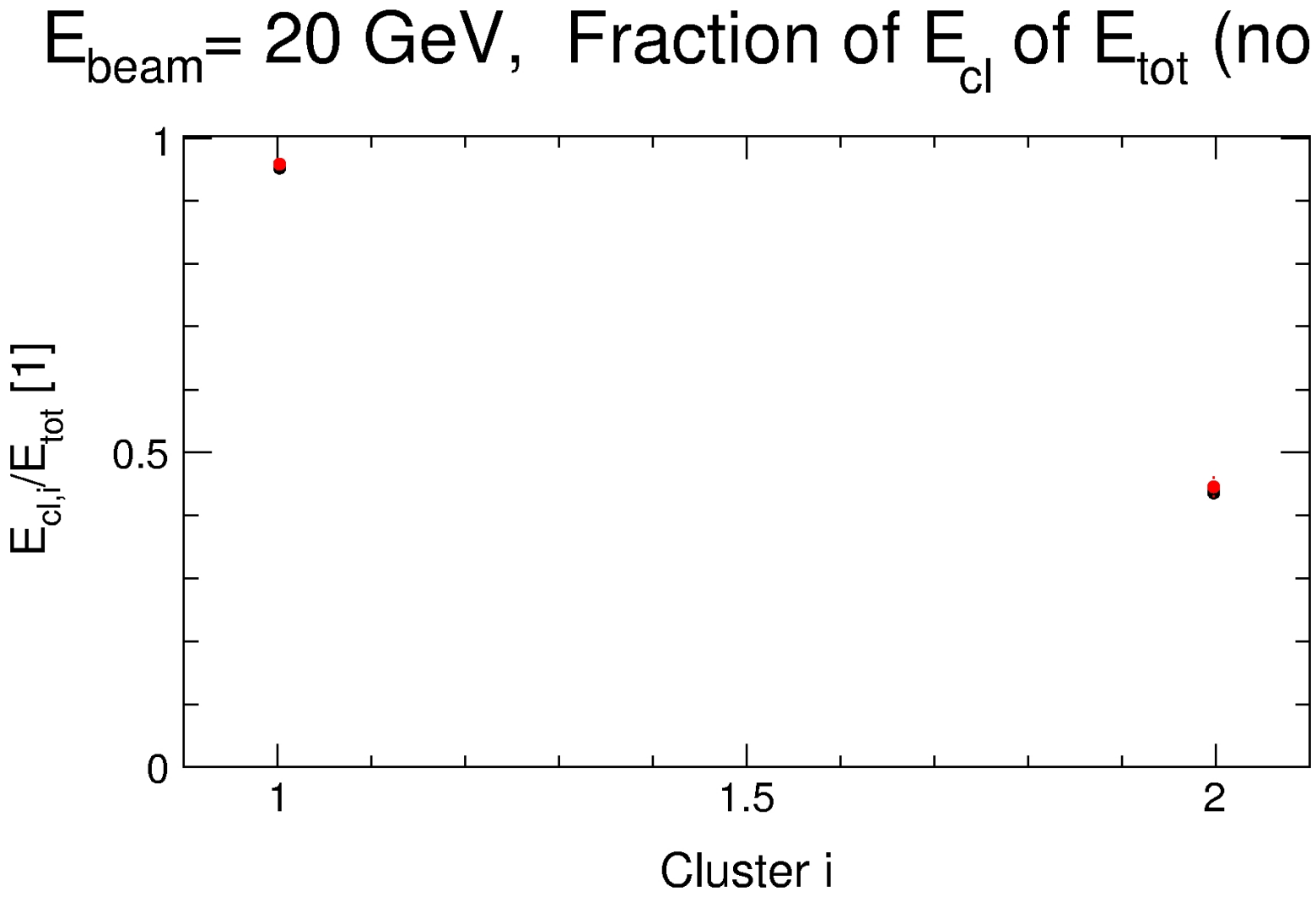
Plans:

→ full energy scan: 1 – 180 GeV

→ different physics list

Appendix

$E_{cl,i}/E_{tot}$, cut: E_{cl}>20GeV*0.3



$E_{cl,i}/E_{tot}$, cut: E_{cl}>20GeV*0.3